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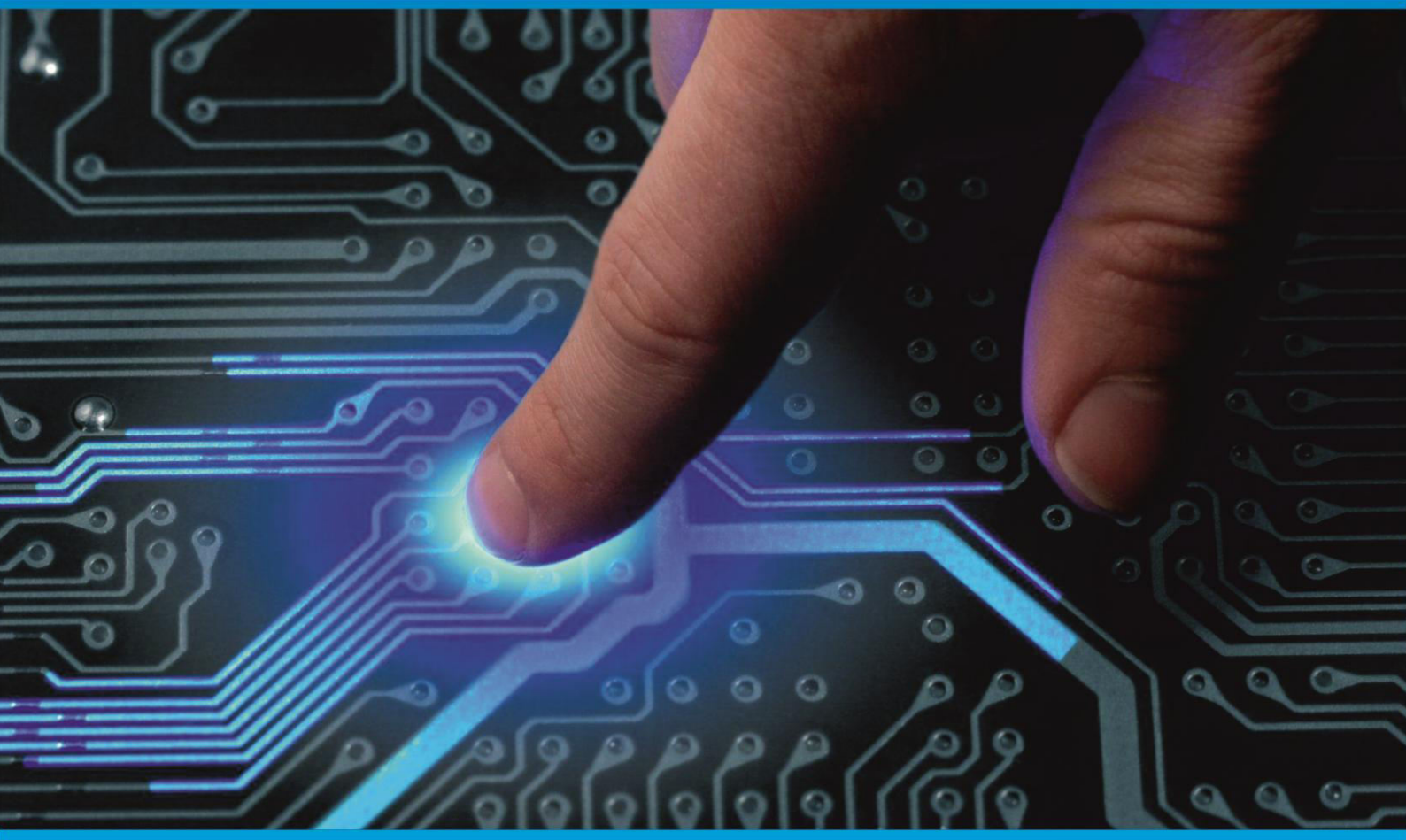

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Survey on Smart Parking System

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ABSTRACT*:* Traffic congestion is a common phenomenon in developing countries like India. This is the quotidian scenario in many of the metropolitan cities. Because of heavy traffic, people lose their valuable time from their busy schedule and also cause pollution while searching for parking spaces. One of the prime reasons causing this heavy traffic is parking on the roadside. So, a need arises to build a parking system in order to reduce the traffic congestion in near future. We are going to develop an Android Application and Internet of Things (IOT) based parking model which will provide parking spaces. Earlier it was difficult to search for a particular space to park a vehicle due to shortage of parking spaces and being offline. But due to the advancements in technology it has been made possible to book for parking spaces online. It will have a user login (Android Application) for people who want to search for parking spaces and admin login (Web Application) that will provide the parking spaces. This android application will help you to pay the booking charge by online payment system

KEYWORDS*:* Traffic Congestion; quotidian; parking; Internet of Things (IOT); Android Application, Web application, online payment system

I. INTRODUCTION

Variety of occasions come up when we visit various public places like shopping malls, 5-star hotels, multiplex cinema halls, schools/colleges, offices etc. The difficulty we encounter many times at these places are the availability of parking spaces. Most of the times we need to travel to find a free space for parking. The problem grows much bigger if parking slots become full and it consumes time. This situation calls for the need for a proper parking system that will not only regulate parking area but will also decrease the manual intervention.

The number of personal vehicles usage is increasing rapidly day by day. Finding a parking space in most of the metropolitan areas, especially during the rush hours, is a difficult task for drivers. Hence a need arises to provide sufficient parking areas coupled with plenty of slots to help the customer park his vehicle safely. This will also ensure the customer that he does not end up parking on non-parking area and cause discomfort to pedestrian.

This proposed project will introduce a scaled down model of ancar parking system that will provide the parking slot at any time to the customer. This proposed project will be a smart parking booking application that will provide customers an easy way of reserving a parking space online. It will overcome the problem of finding a parking space in the busy commercial areas which will unnecessary consume time. Hence this proposed project will offera android based reservation system where customers can view various parking areas and select the space to view whether space is available for booking or not. If the booking space will be available then the customer can book it for specific time slot. On using Android application on user's device, he can make reservation for parking space by providing the information like name, date, time and the id provided while signing in the app. After completing the booking successfully , the user will be provided a booking id that will be verified when he will arrive at the parking space .The booked space will be marked red and will not be available for anyone to book for that particular time.

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This system will provide an additional feature of cancelling the bookings. The customers can cancel their books space anytime. The customers can even make their payment online.

When car arrives at entrance parking area, the given booking id will be verified. If the booking is matched successfully then customer can park the car at designated slot. For retrieval purpose the customer will have to pay bill and extra charges (if any) then only barrier will get opened. This system is based on modules of Android Application. Thus, this system will be useful for the purpose of the car parking and thereby help to reduce car driver's time as the Customers will book their parking spot beforehand.

II. LITERATURE SURVEY

After identifying the above problems related to traffic congestion, environmental pollution, wastage of time, Indisciplinary parking spaces. We took a survey on the following papers to see what type of papers had been published to solve these problems.

[1] Smart Parking Systems obtain information about available parking spaces, process it and then place the car at that position. A prototype of the parking assistance model based on the architecture was developed. The circular design is introduced having rack-pinion mechanism which is used to lift and move the vehicle in desired position place.An advanced car parking system is fabricated and developed in this system using locally available material. This design is efficient because comparing to other existing designs it will carry more vehicles in a limited area. From the simulated result it can be shown that the structure can be designed and implemented for the parking of any type of vehicles.

[2]The issue that usually occurs at the car park is time being wasted in searching for close and proper parking spaces. Users will continue for searching the parking area until they found a vacant parking space. This problem occurs in urban areas, where the amount of vehicles are higher as compared to the parking slots.These inappropriate conditions happens due to lack of implementation in technologies that are easily available today. Various projects have been tried to ensure smoothness of traffic congestion in car park areas. From manual implementations used in the old systems, it has evolved into fully computerized systems.This paper presents an intelligent system for detection of parking spaces based on image processing technique that will capture and process the rounded image drawn at parking area and produce the data of the empty car parking slots. It will get displayed at the display unit that consists of many segments in real time.

[3] In the great majority of cities it is hard and expensive to create more parking areas for vehicles since they have nearly reached its full occupancy. Considering this problem with an inefficient use of parking areas leads to congestions due to antagonism of parking seekers and regular drivers. The new advances in low-cost, low-power embedded systems shows the opportunity to create new ways to solve these problems. Metropolitan cities greatly enrich their sustainability by defining new resource management that rely in those constrained devices that is a significant part of the functionality of the system. The proposed smart parking solution consist on mainly in the on-site deployment of an IOT solution to monitor and signalize the state of availability of each single parking space, as well as using context information generate by the city and its citizens to provide accurate responses to driver's demands.

[4] It addresses the issues in terms of parking systems, traffic law enforcement, road monitoring, and real time application of systems that support intelligent parking systems to improve lives. Number Plate Recognition (NPR) involves main three components: Detection (Number Plate), segmentation of character and Character Recognition of Optical (OCR). For Detection (number plate) and segmentation of character, we are going to use Open CV libraries. And for OCR, Tesseract-OCR. There are numerous NPR systems available today. These systems are based on various methodologies but perhaps it is really tricky job as some of the factors like fast speed of vehicle, improper vehicle number plate and different lights has overloaded the recognition rate. Most of the systems work under these limitations.
[5]Automated parking is a perfect strategy for parking cars using detecting device like sensors. The entering to or leaving from parking lot is also commanded by an android based application. This provide users to book parking spaces online in advance for given location and then park the vehicle with minimal fees. We have focused on some new systems and it displays that the new systems are not totally automated and require a level of human interaction and communication with the system. The uniqueness between their system and existing systems is that they intend to make their system less human independent .The development of bookings for parking slots commanded by android app, number plate identification, parking slot situation and online billing system is implemented. This model reduces the

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user's effort and time to search for parking slot. Also the money transfer is made online which makes the system more human independent.

[6]Sometime if we did not park the car at a time the parking slot is allocated by other at that time the paid money goes wasted. The paid money will not get back. Some of disadvantages listed with the implemented system as the cost and time to develop personal area network technology is very expensive. It gives liability issue of stolen or lost. During peak hours most of the reserved parking area gets full and this leaves behind the customers to search for their parking among other parking spaces which creates more traffic congestion and leaves them with no ideaon availability of parking area. To solve this problem there requires a need for designing parking spaces in commercial surrounding. To make such parking spaces we need to consider of reservation of parking space with optimal parking area which depends on money and required time. Cost procedure will also combine with the parking cost and proximity to the arrival. However here they have designed the time driven method which then solves the issue of parking using allocation method. This paper proposed an app, which is used to create a prototype of Parking Space based on booking thatallows users to find and reserve the empty parking spaces with the help of Internet of Things with space allocation method.

[7]This paper specifies the needs for the production and design of the parking for the Android operating system. This android application includes an efficient vehicle parking search, i.e. empty areas. The interface of user is easy to handle and permit the user to visit between other apps. It will use the Android operating system, which is on a lot of cell phones today. The android uses a market area to sell applications. Web page combines geographic data and parking vacancy details with user location, different data sources in order to let its users find parking slots, when coming for work or driving in city. App has a particular focus on availability of space, data about car parks through sourcing of crowds from the inputs of the customer.

III. PROPOSED METHODOLOGY

After taking the survey from the above pages we have identified that there can be some more work we could do on this topic. The authors of the above papers have made the model using image processing methods and some authors have made an android application/ app for booking the parking spaces. In accordance that people can find better and legal parking spaces and not waste their important time and do not cause traffic .We are going to make an Android based IOT Parking system which will not only help people to find their parking spaces using the android application (app) but also we are going to provide them an complete IOT based parking slots where they can park their vehicles. We will also add an advanced method of online payment system where the customer can pay the amount online. The following algorithm defines the step-by-step approach of the proposed project.

Step1: Initially the slot will be selected by the user from his mobile phone. He will check for the availability of a parking slot that is will be nearest to his location. If it will be available, he will move to the next stage or else go to the initial stage.

Step2:The user will then book the parking slot he desire to and can pay online or offline.

Step3: After selecting the parking slot, the user will then be provided by a booking id.

Step4: The requested slot will be reserved in the parking area for the user.

Step5: After completion of booking of theparticular slot the status of that respective slot will be marked as RED=BOOKED and the remaining will be GREEN=EMPTY.

Step6: As soon as the vehicle arrives at its respective parking space, the booking id provided to the customer after the booking of their slots will be verified.

Step7: If the Booking id gets verified successfully, then the vehicle will be granted the permission to enter their parking slot

IV. CONCLUSION AND FUTURE WORK

This paper summarizes a proper survey on the referred papers. After completing the survey of the papers we got to know that there can be made some development. So we decided to make an android app and the supporting IOT model where the customers can find, book their desired parking spaces and pay for it sitting at their houses. This app will

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allow the users who will take control of the parking decisions and will save their timeof searching several parking spaces physically. Usage of this app at large scale would benefit the user even if a user is in new place. This app will be user friendly and handy so people of all age groups can use it easily. This system will give a visual display to the user regarding the current parking situation. This system will make it easy for the user to book or reserve a space on the smartphone. Thus smartphone will act as a park finder .This will ultimately reduce the time that every driver spends for searching a parking space which will then reduce the fuel consumption, traffic and pollution.

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